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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/579,809	05/16/2006	Michael Horstmann	RO4243US (#90568)	5957

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EXAMINER	
ORWIG, KEVIN S	

ART UNIT	PAPER NUMBER
1611	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/579,809	HORSTMANN, MICHAEL	
	Examiner	Art Unit	
	Kevin S. Orwig	1611	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *29 July 2010*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on _____; the restriction requirement and election have been incorporated into this action.

4)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

5)☒ Claim(s) *1, 4-7, and 9-14* is/are pending in the application.

5a) Of the above claim(s) *13 and 14* is/are withdrawn from consideration.

6)☐ Claim(s) _____ is/are allowed.

7)☒ Claim(s) *1,4-7 and 9-12* is/are rejected.

8)☐ Claim(s) _____ is/are objected to.

9)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

10)☐ The specification is objected to by the Examiner.

11)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

12)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. The amendments filed on Jul. 29, 2010 have been entered.

Status of the Claims

Claims 1, 4-7, and 9-14 are pending. Claim 1 has been amended; claims 2, 3, and 8 are cancelled; claims 13 and 14 are withdrawn. Claims 1, 4-7, and 9-12 are now under consideration. This Office Action is in response to the request for continued examination filed on Jul. 29, 2010.

OBJECTIONS/REJECTIONS MAINTAINED

The rejection of claims 1, 4-7, and 9-12 under 35 U.S.C. 103(a) is maintained as discussed below.

Claim Rejections - 35 USC § 103 (Maintained)

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in *Graham* v. *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

Claims 1, 4-7, and 9-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over CORMIER (U.S. 2002/0016562; Pub. Feb. 7, 2002) in view GONNELLI (U.S. 2004/0106904; Provisional filed Oct. 7, 2002) and WANG (U.S. 2005/0137525; Provisional filed Jun. 4, 2003) (all references of record).

1. Cormier discloses a percutaneous agent delivery device for increasing transdermal flux of an agent and for improving attachment of the device to the skin, wherein the device has a plurality of microprotrusions for piercing and anchoring to the skin (title; abstract). In one embodiment Cormier discloses a passive agent delivery system (par. [0033]; Fig. 26). Referring to this embodiment, Cormier states:

> "The passive transdermal delivery device 88 comprises a reservoir 90 containing agent. Reservoir 90 is preferably in the form of a matrix containing the agent dispersed therein. Reservoir 90 is sandwiched between a backing layer 92, which is preferably impermeable to the agent, and a rate-controlling membrane 94. In FIG. 26, the reservoir 90 is formed of a material, such as a rubbery polymer, that is sufficiently viscous to maintain its shape. If a lower viscosity material is used for reservoir 90, such as an aqueous gel, backing layer 92 and rate-controlling membrane 94 would be sealed together about their periphery to prevent leakage. In a sampling configuration, the reservoir 90 would initially not contain the agent. Located below membrane 94 is microblade array device 2. The device 88 adheres to a body surface by means of contact adhesive layer 96 around the

> periphery of the device 2 and by the anchoring elements of any of the embodiments described previously. The adhesive layer 96 may optionally contain agent. A strippable release liner (not shown) is normally provided along the exposed surface of adhesive layer 96 and is removed prior to application of device 10 to the body surface." (par. [0071]) (emphasis added).

2. Cormier teaches that the required length of the microprotrusions is subject to variation of the body surface being penetrated and one of the principle features of the invention is that the blades are to penetrate the stratum corneum into the epidermis. Usually, the blades will be about 25 μm to about 400 μm in length, with the length for most applications being between about 50 μm to about 200 μm (pars. [0008] and [0044]). Cormier additionally teaches that the reservoir contains permeation enhancers (pars. [0072], [0074], [0076]). Cormier does not teach microneedles that are "helically configured" and "rotatably arranged", and does not expressly teach an adhesive that is coextensive with the microneedle plane.

3. However, Gonnelli discloses a hollow microneedle device for the transport of drug molecules across tissue (title; abstract). Like Cormier, the length of the hollow microneedles is preferably less than 200 μm (par. [0061]). It is noted the term "diffusible material" has not been defined in the instant specification and is thus interpreted broadly. Par. [0028] of the instant specification states that the purpose of such a "diffusible material" is to allow diffusion of the active substances from the reservoir through the microprotrusions into the skin. This effect is achieved via, for example, hollow needles, which are considered to read on this limitation in that the active agents and other excipients (e.g. permeation enhancers) diffuse through the needle to penetrate the skin. While the drug itself is considered to read on the instantly claimed "diffusible material" (consistent with pars. [0008] and [0016] of the published

application), both Cormier (pars. [0072], [0074], [0076]) and Gonnelli (par. [0074) teach the use of penetration enhancers. Alternatively, Gonnelli teaches that the microneedles may be made of bioerodible materials that carry a medicant for delivery to a patient (par. [0032]), which teaching is also considered to read on the instant limitation of a "diffusible material" (see also par. [0054]). Gonnelli teaches an embodiment wherein an array of hollow microneedles is attached to a housing containing drug in an internal reservoir, the device further comprising a backing layer. In this embodiment, Gonnelli also teaches that the housing has a bioadhesive coating around the microneedles. Gonnelli teaches that an adhesive can be used to help secure the device to the tissue of the patient (par. [0028]; Fig. 3). Gonnelli teaches that:

> "In a preferred embodiment, a microneedle device includes an adhesive to temporarily secure the device to the surface of the biological barrier. The adhesive can be essentially anywhere on the device to facilitate contact with the biological barrier. For example, the adhesive can be on the surface of the collar (same side as microneedles), on the surface of the substrate between the microneedles (near the base of the microneedles), or a combination thereof." (par.[0083]). (emphasis added)

4. Thus, Gonnelli establishes that the specific arrangement of the adhesive (e.g. coextensive) is merely a design choice that the skilled artisan would be readily able to make. Gonnelli teaches that the patient can remove a peel-away backing to expose an adhesive coating an then press the device onto a clean part of the skin, leaving it to administer drug over a given time period (see par. [0085]). Gonnelli teaches that the microneedles may comprise plugs having barbs to catch biological tissue (par. [0029]; Figures 4A and 4B; claim 10). The plugs on the microneedles may have a cone or arrowhead shape to form barbed ends for gripping biological tissue (par. [0070]; claim

10). Both Gonnelli (pars. [0019]-[0022]) and Cormier (pars. [0079] and [0080]) teach the use of poly/oligonucleotide drugs and vaccines.

5. Moreover, Wang discloses rotating microneedle arrays that "drill" holes into a biological barrier such as skin. The microneedles can be hollow and the holes can be of controlled depth and are suitable for administering drugs (abstract). According to Wang, it would be desirable to provide an improved system and method for controllably puncture a tissue barrier for injecting/withdrawing materials (drug/gene/body fluids, etc.), and this aim is accomplished through the disclosed microneedle devices (pars. [0004] and [0005]). Wang teaches that the microneedle arrays can be used for transdermal penetration by rotating the microneedles. One salient feature of Wang's microneedle device is the ability of one or more microneedles to rotate along a longitudinal axis while bearing down towards the biological barrier to be penetrated. Such rotary motion facilitates a smooth, steady, and controlled opening of a hole on the surface of the biological barrier. Thus the microneedle device operates much like a drill bit or a screw, instead of a nail abruptly penetrating a surface (par. [0090]). The microneedle, and particularly the tip of the microneedle, can have various shapes, for example, blunt, sharp, beveled, serrated, conical and/or frustoconical. The rotating microneedle operates much like a drill bit and can have a spiral-shaped material disposed on the outside surface of the microneedle tip to facilitate the drilling motion (pars. [0006], [0089]; Figure 8D; claim 34). Wang teaches that the microneedles can be driven by pneumatic or hydraulic actuators (par. [0122]). Wang teaches the attachment of the microneedles to a reservoir (e.g. pars. [0036] and [0051]).

6. In light of these teachings, it would have been *prima facie* obvious to one of ordinary skill in the art at the time of the invention to use at least some "rotatably arranged" microneedles, in the devices of Cormier. One would have been motivated to do so since Wang teaches that rotating microneedles facilitate a smooth, steady, and controlled opening in the skin and that such devices can improve the control of the depth of penetration into the skin. Further, the artisan would also recognize that such a structure, added to the devices of Cormier, would provide the ability to selectively deliver drugs separately from those taught by Cormier that may be in the adhesive layer. Thus, claims 1, 4-7, and 9-12 are rendered obvious by Cormier, Gonnelli, and Wang.

Response to Arguments

Applicant's arguments have been fully considered but are not persuasive. Applicants argue that each of Cormier, Gonnelli, and Wang are deficient (response, p. 7, middle par.).

In response to applicant's arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.,* 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986).

Applicants argue that their claims now require that the microprotrusions are made of a diffusible material (response, p. 8, top).

However, that is a mischaracterization of the instant claims, which merely require

that the microprotrusions *comprise* a diffusible material. As explained above, this limitation is reasonably considered to be met by any of the drug or excipients (e.g. penetration enhancers) moving through the hollow microneedles taught in the cited prior art.

Applicants argue that there is no motivation to combine the references (response, p. 8, bottom).

This argument is perplexing because each of the references is concerned with similar problems (and solutions) in the art, namely the use of microprotrusion-containing devices to improve the transdermal delivery of drugs. There is ample reason for an artisan to look to each of these references.

Conclusion

Claims 1, 4-7, and 9-12 are rejected. No claims are currently allowable.

All claims are drawn to the same invention claimed in the application prior to the entry of the submission under 37 CFR 1.114 and could have been finally rejected on the grounds and art of record in the next Office action if they had been entered in the application prior to entry under 37 CFR 1.114. Accordingly, **THIS ACTION IS MADE FINAL** even though it is a first action after the filing of a request for continued examination and the submission under 37 CFR 1.114. See MPEP § 706.07(b). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the

shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kevin S. Orwig whose telephone number is (571)270-5869. The examiner can normally be reached Monday-Friday 7:00 am-4:00 pm (with alternate Fridays off). If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Sharmila Landau can be reached Monday-Friday 8:00 am-5:00 pm at (571)272-0614. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/KSO/

/Allison M. Ford/

Primary Examiner, Art Unit 1653